ORNITHOLOGICAL LITERATURE

Evolution of the Rails of the South Atlantic Islands (Aves: Rallidae). By Storrs L. Olson. Smithsonian Contributions to Zoology, No. 152, Smithsonian Institution Press, 1973:iv + 53 pp., 11 pl., 8 text figs. Paper cover. $0.95. (Obtainable from Superintendent of Documents, U. S. Govt. Printing Office, Washington, D.C.).—Storrs Olson has spent a number of years studying rails, and this paper presents the results of his Ph.D. thesis. He summarizes and extends our knowledge about the rails of Ascension, St. Helena, Tristan da Cunha, and Gough Islands. People interested in the distribution of rails and in the evolution of flightlessness on islands will find this paper informative and necessary reading.

A new species of flightless extinct rail is described from Ascension and placed in the genus *Atlantisia*, previously containing only a rail from Inaccessible Island. Olson also adds another species to *Atlantisia*, as he synononimizes *Aphanocrex*, a monotypic genus from St. Helena. Thus, the expanded *Atlantisia* is now considered to be composed of three species of flightless rails on as many separated South Atlantic Islands. Olson believes *Atlantisia* is related to the "*Rallus* assemblage," although other than saying that there are skeletal similarities among these birds, he presents no strong evidence for this conclusion. He envisions *Atlantisia* having been derived from a single species that was given to wandering or from two closely related species. It would appear that the only recourse to these speculations is to determine the phylogenetic relationships of the recent species of rails and then fit *Atlantisia* into this scheme.

Olson also describes as new an extinct species of *Porzana*, *P. astrictocarpus*, from St. Helena. This rail was also flightless, having a greatly reduced coracoid and scapula but with a normally developed wing skeleton.

Olson takes up the problem of why some species appear to be good colonizers whereas others do not. *Porphyrula*, for example, has reached various South Atlantic islands, but it has neither colonized nor differentiated. *Gallinula*, on the other hand, has colonized and evolved flightless forms. Skeletal measurements suggest greater variability in *Gallinula*, and Olson postulates that a greater genetic plasticity has enabled *Gallinula* to adapt itself to variable environments more easily than *Porphyrula*. Olson extends this same type of argument to the Rallidae as a whole, claiming their "generalized nature" has permitted this family to successfully colonize islands. Perhaps this is so. The variability-colonizing hypothesis is an old one, and now that we are beginnng to study genetic variability in natural populations through electrophoretic techniques, supportive evidence may be forthcoming.

Olson closes his paper with a discussion on the evolution of flightlessness in rails. He argues that flightlessness is an adaptation, in that a reduction of the pectoral musculature would permit a saving in energy that could be redirected to reproduction. Again, this is an old argument, perhaps reasonable—although probably not the whole story. This hypothesis is amenable to some testing, and it would be most instructive to compare the physiology and energy budgets of flightless *Gallinula* with their flying counterparts.

Perhaps the most interesting part of this paper is the discussion of how, morphogenetically, flightlessness develop. Young individuals, presumably of most species of rails, exhibit the same skeletal proportions as do the adults of flightless species. Thus, it is easy to see that if proportions of young birds were maintained through the growth process, the adults would be flightless. Various factors of the growth process might also explain why rails more than other groups of birds frequently become flightless. In most birds that have been studied, the sternum is partially ossified at hatching or relatively soon thereafter, but in rails it apparently does not ossify until well after hatching. Much more comparative developmental data are needed, but as Olson notes, these differences in rates of ossification very possibly "preadapt" groups such as rails to flightlessness. Olson suggests that these ontogenetic changes would require little genetic modification. This may be true, but so might be the opposite speculation; I doubt whether there is evidence for either viewpoint. In any case, the degree of genetic modification does not bear on the phylogenetic usefulness of flightlessness, as he supposes. All features are of potential value in discerning monophyletic groups and cannot be rejected prior to a comparative analysis. Only after study of one or more other features that suggest alternative relationships can we say that any particular feature does or does not appear to be phylogenetically useful.

In summary, Olson has written a stimulating paper on some interesting birds and problems, and ornithologists of varying persuasions will find it worthwhile reading.—JOEL CRACRAFT.

INTRA-ISLAND VARIATION IN THE MASCARENE WHITE-EYE *ZOSTEROPS BORBONICA*. By Frank B. Gill. Ornithological Monographs No. 12, American Ornithologists' Union, 1973:66 pp., maps, charts, drawings, photographs, color plate by W. A. Lunk. Paper cover. $2.00 ($1.60 to A.O.U. members). (Obtainable from Burt L. Monroe, Jr., Treasurer, A.O.U., Box 23447, Anchorage, Ky. 40223).—In 1964, Robert Storer and Frank Gill visited Reunion Island (500 miles east of Madagascar) and discovered that the endemic *Zosterops borbonica* was remarkably variable in certain plumage characteristics. They decided to recognize a record-breaking four races of the species on this single island (Storer, R. W. and F. B. Gill, Occ. Pap. Mus. Zool. Univ. Michigan No. 648, 1966), a bold decision in this age of lumpers. Gill returned to the island in 1967 for nine months, in order to gather detailed information on geographical distribution of the phenotypes and to answer the question—why, on an island so small (about 1000 square miles in area) is variation so great?

His conclusion contained in this monograph, was arrived at from an analysis of the plumage and size variation in relation to altitude and rainfall of 759 specimens collected at 76 localities; this is supplemented by information on courtship, feeding, movements, activity, etc. of banded birds. Gill recognized three categories of plumage variation. First were birds with gray, brown, or intermediately colored backs. As only 42 adult specimens fell into the intermediate class, and as brown and gray birds are extensively sympatric, interbreed, and produce viable offspring, this he considered an example of genetic polymorphism. Second were brown birds only, varying in head color from fully brown to fully gray, through several intermediates. Although fully brown and fully gray heads predominate, intermediates are more frequent than in the case with back color, hence this is not treated as a genetic polymorphism. Third were birds whose underpart coloration varies from nearly pure white to lead gray, with various amounts of brown in some specimens (confined to the breast and flanks). The predominance of browns and grays in the plumage, by the way, is highly ususual in the white-eye family.

What does this plumage variation mean? It turns out that there are clear and interesting geographical patterns of distribution of the phenotypes. Lowland populations are 100